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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/528,265

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Hideomi Koinuma

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09/19/2008

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT

PAPER NUMBER

1792

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/528,265	Applicant(s) KOINUMA ET AL.	
	Examiner Jeffrie R. Lund	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 4-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I claims 1-3 in the reply filed on July 9, 2007 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li, US Patent 6,911,129.

Li teaches forming a ternary phase diagrammatic system using a mask that includes a first single action edge 85A with an angle of $90^\circ + \alpha$ for a first material; second single action edge 85B with an angle of $30^\circ + \alpha$ for a second material; and a

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third single action edge 85C with an angle of $-30^\circ + \alpha$ for a third material arranged in an equilateral triangle (i.e. spaced 120° relative to each other). Such that said first single action edge acts to determine a film thickness gradient of a first material, said second single action edge acts to determine a film thickness gradient of a second material, and said third single action edge acts to determine a film thickness gradient of a third material. The film deposited is a ternary phase diagrammatic system which is composed with the first, second and third materials (Figure 9, column 8 lines 13-23)

Li differs from the present invention in that Li does not teach that the mask of Figure 9 is moved in by a means for moving the mask in a uniaxial direction across a first material source, a second material source, and a third material source to form a ternary phase diagrammatic system which is composed with the first, second and third materials.

Li teaches a ternary deposition system that includes a mask 58 and means for moving the mask 59 in a uniaxial direction (x) over a first material source 53A, a second material source 53B, and a third material source 53C. (Figure 4, column 5 lines 32-60)

The motivation for replacing the mask of Figure 4 with the mask of Figure 9 is to provide a specific mask as required by Figure 4 but only generically described. Furthermore, it has been held that the simple substitution of one known element for another to obtain predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the mask of Figure 9 in the ternary phase coating

apparatus of Figure 4.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuller et al, US Patent 3,121,078, in view of Li, US Patent 6,911,129.

Fuller et al teaches a mask 75 in the form of a rotating disk for depositing a layer of graduated thickness. (Figure 9, column 8 lines 5-15)

Fuller et al differs from the present invention in that Fuller et al does not teach that the mask includes a first single action edge 85A with an angle of $90^\circ + \alpha$ for a first material, second single action edge 85B with an angle of $30^\circ + \alpha$ for a second material, and a third single action edge 85C with an angle of $-30^\circ + \alpha$ for a third material arranged in an equilateral triangle (i.e. spaced 120° relative to each other).

Li was discussed above and teaches a mask that includes a first single action edge 85A with an angle of $90^\circ + \alpha$ for a first material, second single action edge 85B with an angle of $30^\circ + \alpha$ for a second material, and a third single action edge 85C with an angle of $-30^\circ + \alpha$ for a second material arranged in an equilateral triangle (i.e. spaced 120° relative to each other) to deposit a ternary phase layer in a ternary phase diagrammatic system.

The motivation for forming the mask pattern of Li on the rotating disk of Fuller et al is to deposit a ternary layer containing two-dimensional relative concentration fractions of three vapors as taught by Li.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the mask pattern of Li in the rotating mask of Fuller et al.

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6. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li, US Patent 6,911,129.

Li teaches a masking mechanism that includes a mask 58 and means for moving the mask 59 in a uniaxial direction (x) over a first material source 53A, a second material source 53B, and a third material source 53C. (Figure 4, column 5 lines 32-60) Li also teaches various masks for forming various binary and ternary phase films, including, a mask that includes a first single action edge 85A with an angle of $90^\circ + \alpha$ for a first material; second single action edge 85B with an angle of $30^\circ + \alpha$ for a second material; and a third single action edge 85C with an angle of $-30^\circ + \alpha$ for a third material arranged in an equilateral triangle (i.e. spaced 120° relative to each other). Such that said first single action edge acts to determine a film thickness gradient of a first material, said second single action edge acts to determine a film thickness gradient of a second material, said third single action edge acts to determine a film thickness gradient of a third material, and the film is a ternary phase diagrammatic system which is composed with the first, second and third materials (Figure 9, column 8 lines 13-23)

Li differs from the present invention in that Li does not teach the specific arrangement of action edges.

The motivation for arranging the action edges of Li in a specific pattern is to form a specific mask for depositing a specific film having a desired distribution of materials. Furthermore it has been held that:

- a. a change in shape is a matter of choice which a person of ordinary skill in the art would have found obvious. (See *In re Dailey*, 357 F.2d 669,149 USPQ 47 (CCPA 1966) MPEP 2144.04.IV.B); and
- b. applying a known technique to a known device ready for improvement to yield predictable results is obvious (see *KSR International Co. v. Teleflex Inc.*).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the action edges of Li in a specific pattern to form a specific mask to deposit a specific film have a desired distribution of materials as taught by Li.

Response to Arguments

7. Applicant's arguments filed July 7, 2008 have been fully considered but they are not persuasive.

In regard to the argument that:

- (1) Applicants respectfully submit that neither Li nor Fuller in view of Li teach or suggest: said first single action edge acts to determine a film thickness gradient of a first material, said second single action edge acts to determine a. film thickness gradient of a second material, and said third single action edge acts to determine a film thickness gradient of a third material, and

the film is a ternary phase diagrammatic system which is composed with the first, second and third materials.

The Examiner disagrees. Li specifically teaches the first single action edge acts to determine a film thickness gradient of a first material, said second single action edge acts to determine a. film thickness gradient of a second material, and said third single action edge acts to determine a film thickness gradient of a third material, and the film is a ternary phase diagrammatic system which is composed with the first, second and third

materials in column 8 lines 13-23. In fact, any mask having 3 cutouts used with a ternary gas supply system will inherently deposit the claimed ternary layer.

In regard to the argument that: "Fuller does not teach or suggest a single disk having cutouts", the Examiner disagrees. As noted by the Applicant, Fuller et al teaches a masking disk 75 having triangular apertures, which is the same thing as a single disk having cutouts.

In response to applicant's arguments against Fuller et al individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The combination of Fuller and Li teach a ternary phase diagram thin film.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (10:00 am - 9:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrie R. Lund/
Primary Examiner
Art Unit 1792

JRL
9/14/08